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SEMIANNUAL ENVIRONMENTAL MONITORING REPORT

for

1/1/85 to 6/30/85



Prepared

By

RIO ALGOM CORPORATION

Source Materials License Number - SUA-1119

Docket Number - 40-8084



U.S. NUC.  
LIC. FEE MGMT. BRANCH

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RECEIVED

*W. D. Lawton*

M. D. Lawton  
Manager

8-30-85

Date

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DESIGNATED ORIGINAL  
Certified By *Mary C. Hood*

FEE EXEMPT

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1) STACK - YELLOWCAKE AND ORE

DATE COLLECTED	LOCATION OPERATING HRS. X	FLOW RATE (M <sup>3</sup> /Sec.) y	RADIONUCLIDE	AVERAGE IN-STACK CONCENTRATION (uCi/ml) z	ERROR ESTIMATE (uCi/ml)	(a) RELEASE (Curies)	ERROR ESTIMATE (Curies)	LLD (uCi/ml)	(b) % M
1/1/85 thru 6/30/85	Yellowcake (c) Dust Filter 2150	0.17	U-Nat	0.24E-10	---	3.54E-5	---	1.E-12	24
			Th-230	4.32E-12	2.89E-12	0.066E-5	0.07E-5	1.6E-14	216
			Ra-226	0.29E-11	0.24E-11	0.42E-5	0.06E-5	4.E-13	9.
			Pb-210	0.02E-10	0.11E-10	0.30E-5	0.28E-5	8.E-13	2.
1/1/85 thru 6/30/85	Yellowcake (c) Scrubber 2150	0.64	U-Nat	10.9E-10	---	5.22E-3	---	1.E-12	109
			Th-230	10.8E-12	4.1E-12	6.06E-5	0.38E-5	1.6E-14	540
			Ra-226	0.69E-11	0.28E-11	3.6E-5	0.25E-5	4.E-13	23
			Pb-210	0.06E-10	0.11E-10	3.0E-10	1.01E-5	8.E-13	6.
1/1/85 thru 6/30/85	Dryer (c) Center Column	0.21	U-Nat	0.40E-10	---	6.96E-5	---	1.E-12	40
			Th-230	6.84E-12	8.35E-12	12.0E-5	0.23E-5	1.6E-14	342
			Ra-226	1.42E-11	0.89E-11	2.46E-5	0.25E-5	4.E-13	47
			Pb-210	-0-	0.35E-10	-0-	1.01E-5	8.E-13	-0-
1/1/85 thru 6/30/85	Crusher (d) House 1470	2.72	U-Nat	0.12E-10	---	17.1E-5	---	1.E-12	12
			Th-230	2.22E-12	0.75E-12	2.88E-5	0.16E-5	1.6E-14	22
			Ra-226	0.29E-11	0.08E-11	3.78E-5	0.17E-5	4.E-13	5.
			Pb-210	0.03E-10	0.02E-10	3.90E-5	0.43E-5	8.E-13	1.
1/1/85 thru 6/30/85	Transfer (d) House 1470	0.69	U-Nat	0.05E-10	---	1.64E-5	---	1.E-12	5
			Th-230	3.52E-12	0.73E-12	1.08E-5	0.04E-5	1.6E-14	35
			Ra-226	0.17E-11	0.06E-11	0.54E-5	0.03E-5	4.E-13	3.
			Pb-210	0.02E-10	0.02E-10	0.60E-5	0.1E-5	8.E-13	1.
1/1/85 thru 6/30/85	Headframe (d) House 1470	3.40	U-Nat	0.05E-10	---	6.73E-5	---	1.E-12	5
			Th-230	0.34E-12	0.24E-12	0.48E-5	0.06E-5	1.6E-14	3.
			Ra-226	0.01E-10	0.01E-10	0.12E-5	0.02E-5	4.E-13	0.
			Pb-210	-0-	0.08E-10	-0-	2.0E-5	8.E-13	-0-

- a) Release calculation =  $x(\text{hrs.}) \cdot 3600 \text{ sec./hr.} \cdot y(\text{M}^3/\text{sec.}) \cdot z(\text{uCi/ml}) \cdot 10^6 \text{ ml/M}^3 = 3,600 \cdot xyz (\text{Ci.})/6. \text{ mo.}$
- b) No atmospheric dispersion considerations or background adjustments were used in stack % MPCa calculations.
- c) Yellowcake MPCa = Soluble (Restricted Areas).
- d) Ore Dust MPCa = Insoluble (Restricted Areas).

2) AIR SAMPLES - Air Particulates and Radon Gas

DATE COLLECTED	LOCATION	RADIONUCLIDE	GROSS CONCENTRATION (uCi/ml)	ERROR ESTIMATE (uCi/ml)	LLD (uCi/ml)	(e) % MPCa
January thru June 1985	EM-1 (S-1)	U-Nat	0.63E-15	---	5.E-16	0.01
		Th-230	1.18E-15	0.57E-15	5.E-16	
		Ra-226	0.38E-15	0.25E-15	5.E-16	0.01
		Pb-210	14.5E-15	1.3E-15	2.E-14	0.4
		Rn-222 (gas)	2.4E-11	1.66E-11	2.E-10	0.8
January thru June 1985	EM-2 (S-2)	U-Nat	2.78E-15	---	5.E-16	0.05
		Th-230	1.06E-15	0.66E-15	5.E-16	
		Ra-226	0.34E-15	0.23E-15	5.E-16	0.01
		Pb-210	17.4E-15	1.5E-15	2.E-14	0.4
		Rn-222 (gas)	3.1E-11	2.1E-11	2.E-10	1.0
January thru June 1985	EM-3 (S-3)	U-Nat	3.96E-15	---	5.E-16	0.08
		Th-230	1.22E-15	0.57E-15	5.E-16	
		Ra-226	-0-	-0-	5.E-16	-0-
		Pb-210	14.1E-15	1.4E-15	2.E-14	0.4
		Rn-222 (gas)	1.25E-11	0.95E-11	2.E-10	0.4
January thru June 1985	EM-4 (S-4)	U-Nat	1.63E-15	---	5.E-16	0.03
		Th-230	1.13E-15	0.73E-15	5.E-16	
		Ra-226	0.19E-15	0.17E-15	5.E-16	0.01
		Pb-210	13.3E-15	1.4E-15	2.E-14	0.3
		Rn-222 (gas)	1.6E-11	1.06E-11	2.E-10	0.5
January thru June 1985	EM-5 (S-5)	U-Nat	3.38E-15	---	5.E-16	0.07
		Th-230	1.18E-15	0.58E-15	5.E-16	
		Ra-226	0.30E-15	0.22E-15	5.E-16	0.01
		Pb-210	13.6E-15	14.E-15	2.E-14	0.3
		Rn-222 (gas)	1.75E-11	1.1E-11	2.E-10	0.6
January thru June 1985	EM-6 (S-6) Bckgrd.	U-Nat	4.90E-15	---	5.E-16	0.10
		Th-230	1.29E-15	0.57E-15	5.E-16	
		Ra-226	0.17E-15	0.17E-15	5.E-16	0.01
		Pb-210	16.0E-15	1.5E-15	2.E-14	0.4
		Rn-222 (gas)	2.0E-11	1.55E-11	2.E-10	0.7

e) % MPCa is based upon gross nuclide concentrations divided by the appropriate unrestricted area MPCa from Table 1 on Page 14. No subtraction of EM-6 concentrations (area background) have been performed.

3a) LIQUID SAMPLES - Dissolved Radionuclides in Groundwaters

DATE COLLECTED	LOCATION	TYPE AREA	RADIONUCLIDE	GROSS AVERAGE CONCENTRATION (uCi/ml)	ERROR ESTIMATE (uCi/ml)	LLD (uCi/ml)	NET AVERAGE CONCENTRATION (uCi/ml)	% MPCw
January 1985 thru June 1985	MW-1	Groundwater Restricted	U-Nat	6.06E-7	---	9.E-9	5.89E07	-0-
			Th-230	1.30E-9	0.70E-9	1.E-9	0.3E-9	-0-
			Ra-226	0.92E-9	0.42E-9	1.E-9	0.45E-9	0.1
			Pb-210	0.62E-9	0.97E-9	2.E-9	0.62E-9	-0-
			Po-210	N/A	---	2.E-9		
January 1985 thru June 1985	MW-2	Groundwater Restricted	U-Nat	4.30E-7	---	9.E-9	4.13E-7	-0-
			Th-230	4.30E-9	1.07E-9	1.E-9	3.3E-9	-0-
			Ra-226	0.71E-9	0.37E-9	1.E-9	0.2E-9	0.1
			Pb-210	0.41E-9	1.05E-9	2.E-9	0.41E-9	-0-
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	MW-4	Groundwater Unrestricted	U-Nat	33.3E-9	---	9.E-9	33.1E-7	-0-
			Th-230	2.27E-9	0.84E-9	1.E-9	1.27E-9	0.1
			Ra-226	1.02E-9	0.46E-9	1.E-9	0.55E-9	1.8
			Pb-210	0.49E-9	0.98E-9	2.E-9	0.49E-9	-0-
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	MW-5 Background	Groundwater Unrestricted	U-Nat	0.17E-7	---	9.E-9	N/A	-0-
			Th-230	1.00E-9	0.6E-9	1.E-9	N/A	0.1
			Ra-226	0.47E-9	0.32E-9	1.E-9	N/A	1.6
			Pb-210	-0-	0.93E-9	2.E-9	N/A	-0-
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	MW-7	Groundwater Restricted	U-Nat	490.4E-7	---	9.E-9	490.2E-7	4.9
			Th-230	21.0E-9	2.1E-9	1.E-9	20.0E-9	-0-
			Ra-226	4.59E-9	1.22E-9	1.E-9	4.12E-9	1.0
			Pb-210	1.20E-9	0.95E-9	2.E-9	1.20E-9	-0-
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	MW-8	Groundwater Restricted	U-Nat	306.01E-7	---	9.E-9	305.8E-7	3.1
			Th-230	10.1E-9	1.6E-9	1.E-9	9.1E-9	-0-
			Ra-226	0.85E-9	0.42E-9	1.E-9	0.38E-9	0.1
			Pb-210	2.28E-9	1.00E-9	2.E-9	2.28E-9	0.1
			Po-210	N/A		2.E-9		
January 1985 thru June 1985			U-Nat			9.E-9		
			Th-230			1.E-9		
			Ra-226			1.E-9		
			Pb-210			2.E-9		
			Po-210			2.E-9		

$$\% \text{ MPCw} = \frac{\text{Average Gross Concentration} - \text{Background (MW-5) Concentration}}{\text{MPCw from Table I}} \times 100$$

3a) LIQUID SAMPLES - Dissolved Radionuclides in Groundwaters

DATE COLLECTED	LOCATION	TYPE AREA	RADIONUCLIDE	GROSS AVERAGE CONCENTRATION (uCi/ml)	ERROR ESTIMATE (uCi/ml)	LLD (uCi/ml)	NET AVERAGE CONCENTRATION (uCi/ml)	% MPCw
January 1985 thru June 1985	MW-11	Groundwater	U-Nat	32.4E-7	---	9.E-9	32.2E-7	0.3
			Th-230	3.03E-9	1.27E-9	1.E-9	2.03D-9	-0-
			Ra-226	0.28E-9	0.23E-9	1.E-9	-0-	-0-
			Pb-210	0.36E-9	0.92E-9	2.E-9	0.36E-9	-0-
			Po-210	N/A		2.E-9		
January 1985 thru June 1985		Groundwater	U-Nat			9.E-9		
			Th-230			1.E-9		
			Ra-226			1.E-9		
			Pb-210			2.E-9		
			Po-210			2.E-9		
January 1985 thru June 1985	H-10	Groundwater	U-Nat	0.24E-7	---	9.E-9	0.07E-7	-0-
			Th-230	2.5E-9	0.9E-9	1.E-9	1.5E-9	-0-
			Ra-226	3.71E-9	0.86E-9	1.E-9	3.24E-9	0.8
			Pb-210	0.44E-9	0.95E-9	2.E-9	0.44E-9	-0-
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	H-38	Groundwater	U-Nat	0.40E-7	---	9.E-9	0.23E-7	-0-
			Th-230	0.91E-9	0.57E-9	1.E-9	-0-	-0-
			Ra-226	0.97E-9	0.44E-9	1.E-9	0.5E-9	0.1
			Pb-210	0.64E-9	0.96E-9	2.E-9	0.64E-9	-0-
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	H-49	Groundwater	U-Nat	23.54E-7	---	9.E-9	23.3E-7	7.8
			Th-230	0.58E-9	0.52E-9	1.E-9	-0-	-0-
			Ra-226	0.96E-9	0.31E-9	1.E-9	0.49E-9	0.1
			Pb-210	0.58E-9	0.95E-9	2.E-9	0.58E-9	-0-
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	H-55	Groundwater	U-Nat	484.8E-7	---	9.E-9	484.6E-7	4.8
			Th-230	N/A		1.E-9		
			Ra-226	2.31E-9	0.91E-9	1.E-9	0.47E-9	0.1
			Pb-210	N/A		2.E-9		
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	H-56	Groundwater	U-Nat	601.9E-7	---	9.E-9	601.7E-7	6.0
			Th-230	13.2E-9	1.6E-9	1.E-9	12.2E-9	-0-
			Ra-226	0.46E-9	0.31E-9	1.E-9	-0-	-0-
			Pb-210	19.8E-9	1.33E-9	2.E-9	19.8E-9	5.5
			Po-210	N/A		2.E-9		

$$\% \text{ MPCw} = \frac{\text{Average Gross Concentration} - \text{Background (MW-5) Concentration}}{\text{MPCw from Table I}} \times 100$$



3a) LIQUID SAMPLES - Dissolved Radionuclides in Groundwaters

DATE COLLECTED	LOCATION	TYPE AREA	RADIONUCLIDE	GROSS AVERAGE CONCENTRATION (uCi/ml)	ERROR ESTIMATE (uCi/ml)	LLD (uCi/ml)	NET AVERAGE CONCENTRATION (uCi/ml)	% MPCw
January 1985 thru June 1985	H-71	Groundwater	U-Nat	0.58E-7	---	9.E-9	0.41E-7	0.1
			Th-230	4.5E-9	0.88E-9	1.E-9	3.5E-9	-0-
			Ra-226	0.23E-9	0.21E-9	1.E-9	-0-	-0-
			Pb-210	0.82E-9	0.91E-9	2.E-9	1.34E-9	0.3
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	H-72	Groundwater	U-Nat			9.E-9		
			Th-230			1.E-9		
			Ra-226			1.E-9		
			Pb-210			2.E-9		
			Po-210			2.E-9		
January 1985 thru June 1985	H-73	Groundwater	U-Nat	0.74E-7	---	9.E-9	0.57E-7	0.2
			Th-230	2.0E-9	0.63E-9	1.E-9	1.0E-9	-0-
			Ra-226	1.81E-9	0.62E-9	1.E-9	1.3E-9	0.3
			Pb-210	0.06E-9	0.94E-9	2.E-9	0.06E-9	-0-
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	H-77	Groundwater	U-Nat			9.E-9		
			Th-230			1.E-9		
			Ra-226			1.E-9		
			Pb-210			2.E-9		
			Po-210			2.E-9		
January 1985 thru June 1985	H-78	Groundwater	U-Nat	0.23E-7	---	9.E-9	6.0E-9	-0-
			Th-230	8.7E-9	1.2E-9	1.E-9	7.7E-9	-0-
			Ra-226	0.74E-9	0.37E-9	1.E-9	0.27E-9	-0-
			Pb-210	-0-	0.93E-9	2.E-9	-0-	-0-
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	D-10	Groundwater	U-Nat	10.46E-7		9.E-9	10.28E-7	3.4
			Th-230	1.9E-9	0.62E-9	1.E-9	0.9E-9	-0-
			Ra-226	1.38E-9	0.53E-9	1.E-9	0.9E-9	0.2
			Pb-210	1.41E-9	0.94E-9	2.E-9	1.41E-9	-0-
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	DM80-1	Groundwater	U-Nat	6.06E-7	---	9.E-9	5.89E-7	2.0
			Th-230	7.6E-9	1.3E-9	1.E-9	6.6E-9	-0-
			Ra-226	1.90E-9	0.62E-9	1.E-9	1.4E-9	0.4
			Pb-210	-0.83E-9	0.94E-9	2.E-9	0.83E-9	-0-
			Po-210	N/A		2.E-9		

$$\% \text{ MPCw} = \frac{\text{Average Gross Concentration} - \text{Background (MW-5) Concentration}}{\text{MPCw from Table I}} \times 100$$

3a) LIQUID SAMPLES - Dissolved Radionuclides in Groundwaters

DATE COLLECTED	LOCATION	TYPE AREA	RADIONUCLIDE	GROSS AVERAGE CONCENTRATION (uCi/ml)	ERROR ESTIMATE (uCi/ml)	LLD (uCi/ml)	NET AVERAGE CONCENTRATION (uCi/ml)	% MPCw
	DM80-2	Groundwater Unrestricted	U-Nat			9.E-9		
			Th-230			1.E-9		
			Ra-226			1.E-9		
			Pb-210			2.E-9		
			Po-210			2.E-9		
	DM80-3	Groundwater Unrestricted	U-Nat			9.E-9		
			Th-230			1.E-9		
			Ra-226			1.E-9		
			Pb-210			2.E-9		
			Po-210			2.E-9		
	DM80-4	Groundwater Unrestricted	U-Nat			9.E-9		
			Th-230			1.E-9		
			Ra-226			1.E-9		
			Pb-210			2.E-9		
			Po-210			2.E-9		
January 1985 Thru June 1985	RW-1	Groundwater Restricted	U-Nat	578.6E-7	---	9.E-9	578.4E-7	192.8
			Th-230	22.7E-9	2.2E-9	1.E-9	21.7E-9	-0-
			Ra-226	1.27E-9	0.49E-9	1.E-9	0.8E-9	0.2
			Pb-210	13.7E-9	1.29E-9	2.E-9	13.7E-9	0.3
			Po-210	N/A		2.E-9		
January 1985 thru June 1985	RW-2	Groundwater Restricted	U-Nat	179.9E-7	---	9.E-9	178.8E-5	59.6
			Th-230	4.7E-9	1.1E-9	1.E-9	3.7E-9	-0-
			Ra-226	0.27E-9	0.23E-9	1.E-9	-0-	-0-
			Pb-210	8.81E-9	1.16E-9	2.E-9	8.81E-9	0.2
			Po-210	N/A		2.E-9		
			U-Nat			9.E-9		
			Th-230			1.E-9		
			Ra-226			1.E-9		
			Pb-210			2.E-9		
			Po-210			2.E-9		
			U-Nat			9.E-9		
			Th-230			1.E-9		
			Ra-226			1.E-9		
			Pb-210			2.E-9		
			Po-210			2.E-9		

$$\% \text{ MPCw} = \frac{\text{Average Gross Concentration} - \text{Background (MW-5) Concentration}}{\text{MPCw from Table I}} \times 100$$

3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	MW-1 Restricted Area	Groundwater	Alkalinity	276	102	NA	---
			Chloride	539	505	250. <sup>1</sup>	215.6
			Nitrate (NO <sub>3</sub> -N)	36	32	10. <sup>2,3</sup>	360
			Selenium	0.001	0	.01 <sup>1,2,3</sup>	0
			Sulfate	260	139	250. <sup>1</sup>	104
			pH (SU)	7.83	0.23	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	2550	1855	NA	---
			Total Dissolved Solids	1594	1238	500. <sup>1</sup>	3188
			Fluoride	0.49	0.15	1.4 to 2.4 (1,2,3)	---
			Water Level	60.91'	NA	NA	---
			Alkalinity	263	89	NA	---
January 1985 thru June 1985	MW-2 Restricted Area	Groundwater	Chloride	448	414	250. <sup>1</sup>	179.2
			Nitrate (NO <sub>3</sub> -N)	30	26	10. <sup>2,3</sup>	300
			Selenium	0.001	0	.01 <sup>1,2,3</sup>	0
			Sulfate	222	101	250. <sup>1</sup>	88.8
			pH (SU)	7.7	0.10	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	2200	1505	NA	---
			Total Dissolved Solids	1349	993	500. <sup>1</sup>	269.8
			Fluoride	0.50	0.16	1.4 to 2.4 (1,2,3)	---
			Water Level	61.41'	NA	NA	---
			Alkalinity	263	89	NA	---
			Chloride	448	414	250. <sup>1</sup>	179.2

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- NRC G.E.I.S. '79

- EPA Drinking Water Standard

3 - Utah State Drinking Water Standards

4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations



3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	MW-4  Unrestricted Area	Groundwater	Alkalinity	438	264	NA	---
			Chloride	290	256	250. <sup>1</sup>	102.4
			Nitrate (NO <sub>3</sub> -N)	70	66	10. <sup>2,3</sup>	660.0
			Selenium	0.014	0.012	.01 <sup>1,2,3</sup>	120.0
			Sulfate	993	872	250. <sup>1</sup>	397.2
			pH (SU)	7.8	0.2	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	3300	2605	NA	---
			Total Dissolved Solids	2374	2018	500. <sup>1</sup>	474.8
			Fluoride	0.44		1.4 to 2.4 (1,2,3)	---
			Water Level	133.51'	NA	NA	---
January 1985 thru June 1985	MW-5  Unrestricted Area  Background Well	Groundwater	Alkalinity	174	NA	NA	---
			Chloride	34	NA	250. <sup>1</sup>	13.6
			Nitrate (NO <sub>3</sub> -N)	4	NA	10. <sup>2,3</sup>	40
			Selenium	0.007	NA	.01 <sup>1,2,3</sup>	20
			Sulfate	121	NA	250. <sup>1</sup>	48.4
			pH (SU)	7.6	NA	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	695	NA	NA	---
			Total Dissolved Solids	356	NA	500. <sup>1</sup>	71.2
			Fluoride	0.34	NA	1.4 to 2.4 (1,2,3)	---
			Water Level	163.59'	NA	NA	---

- NRC G.E.I.S. '79

3 - Utah State Drinking Water Standards

- EPA Drinking Water Standard

4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	MW-7 Restricted Area	Groundwater	Alkalinity	1438	1264	NA	---
			Chloride	985	951	250. <sup>1,4</sup>	380.4
			Nitrate (NO <sub>3</sub> -N)	92	88	10. <sup>2,3</sup>	880.0
			Selenium	0.001	-0-	.01 <sup>1,2,3</sup>	-0-
			Sulfate	5434	5313	250. <sup>1</sup>	2173.6
			pH (SU)	7.3	-0.3	6.5 to 9.0 <sup>3</sup>	---
			Conductivity(uomho/cm)	14611	13916	NA	---
			Total Dissolved Solids	11266	10910	500. <sup>1</sup>	2253.2
			Fluoride	0.14	-0.2	1.4 to 2.4 (1,2,3)	---
			Water Level	148.75'	NA	NA	---
January 1985 thru June 1985	MW-8 Restricted Area	Groundwater	Alkalinity	1078	904	NA	---
			Chloride	715	681	250. <sup>1</sup>	272.0
			Nitrate (NO <sub>3</sub> -N)	240	236	10. <sup>2,3</sup>	236.0
			Selenium	0.027	0.025	.01 <sup>1,2,3</sup>	250
			Sulfate	4161	4040	250. <sup>1</sup>	1664
			pH (SU)	7.08	-0.5	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	11738	11043	NA	---
			Total Dissolved Solids	8934	8578	500. <sup>1</sup>	1786.8
			Fluoride	0.14		1.4 to 2.4 (1,2,3)	---
			Water Level	178.89'	NA	NA	---

- NRC G.E.I.S. '79

3 - Utah State Drinking Water Standards

- EPA Drinking Water Standard

4 - Net Concentrations = Gross Concentrations minus Background well #5 Concentrations

3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	MW-11 Restricted Area	Groundwater	Alkalinity	451	277	NA	---
			Chloride	916	882	250. <sup>1</sup>	352.8
			Nitrate (NO <sub>3</sub> -N)	61	57	10. <sup>2,3</sup>	570
			Selenium	0.001	-0-	.01 <sup>1,2,3</sup>	-0-
			Sulfate	725	604	250. <sup>1</sup>	290
			pH (SU)	7.7	-0-	6.5 to 9.0 <sup>3</sup>	---
			Conductivity(uomho/cm)	4300	4297	NA	---
			Total Dissolved Solids	2913	2557	500. <sup>1</sup>	582.6
			Fluoride	0.50	0.16	1.4 to 2.4 (1,2,3)	---
			Water Level	61.82'	NA	NA	---
January 1985 thru June 1985	MW-12 Restricted Area	Groundwater	Alkalinity			NA	---
			Chloride			250. <sup>1</sup>	
			Nitrate (NO <sub>3</sub> -N)			10. <sup>2,3</sup>	
			Selenium			.01 <sup>1,2,3</sup>	
			Sulfate			250. <sup>1</sup>	
			pH (SU)			6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)			NA	---
			Total Dissolved Solids			500. <sup>1</sup>	
			Fluoride			1.4 to 2.4 (1,2,3)	---
			Water Level		NA	NA	---

- NRC G.E.I.S. '79

3 - Utah State Drinking Water Standards

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4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	H-10 Restricted Area	Groundwater	Alkalinity	339	165	NA	---
			Chloride	3278	3344	250. <sup>1</sup>	1337.6
			Nitrate (NO <sub>3</sub> -N)	37	33	10. <sup>2,3</sup>	330
			Selenium	0.001	-0-	.01 <sup>1,2,3</sup>	-0-
			Sulfate	308	187	250. <sup>1</sup>	123.5
			pH (SU)	7.5	-0.1	6.5 to 9.0 <sup>3</sup>	---
			Conductivity(uomho/cm)	9850	9155	NA	---
			Total Dissolved Solids	6434	6078	500. <sup>1</sup>	
			Fluoride	0.43	0.09	1.4 to 2.4 (1,2,3)	---
			Water Level	53.09'	NA	NA	---
			Alkalinity	278	104	NA	---
January 1985 thru June 1985	H-38 Restricted Area	Groundwater	Chloride	1215	1181	250. <sup>1</sup>	472
			Nitrate (NO <sub>3</sub> -N)	28	24	10. <sup>2,3</sup>	240
			Selenium	0.011	0.009	.01 <sup>1,2,3</sup>	90
			Sulfate	338	217	250. <sup>1</sup>	135.2
			pH (SU)	7.6	-0-	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	4300	3605	NA	---
			Total Dissolved Solids	2842	2486	500. <sup>1</sup>	568.4
			Fluoride	0.43	0.09	1.4 to 2.4 (1,2,3)	---
			Water Level	104.21'	NA	NA	---
			Alkalinity	278	104	NA	---
			Chloride	1215	1181	250. <sup>1</sup>	472

- NRC G.E.I.S. '79

- EPA Drinking Water Standard

3 - Utah State Drinking Water Standards

4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	H-48 Restricted Area	Groundwater	Alkalinity			NA	---
			Chloride			250. <sup>1</sup>	
			Nitrate (NO <sub>3</sub> -N)			10. <sup>2,3</sup>	
			Selenium			.01 <sup>1,2,3</sup>	
			Sulfate			250. <sup>1</sup>	
			pH (SU)			6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)			NA	---
			Total Dissolved Solids			500. <sup>1</sup>	
			Fluoride			1.4 to 2.4 (1,2,3)	---
			Water Level		NA	NA	---
January 1985 thru June 1985	H-49A Unrestricted Area	Groundwater	Alkalinity	348	174	NA	---
			Chloride	186	152	250. <sup>1</sup>	60.8
			Nitrate (NO <sub>3</sub> -N)	19	15	10. <sup>2,3</sup>	150.0
			Selenium	0.02	0.018	.01 <sup>1,2,3</sup>	180
			Sulfate	707	586	250. <sup>1</sup>	282.8
			pH (SU)	7.8	0.2	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	2500	1805	NA	---
			Total Dissolved Solids	1829	1473	500. <sup>1</sup>	365.8
			Fluoride	0.98	0.64	1.4 to 2.4 (1,2,3)	---
			Water Level	105.44'	NA	NA	---

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3 - Utah State Drinking Water Standards

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4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations



3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	H-55 Restricted Area	Groundwater	Alkalinity			NA	---
			Chloride			250. <sup>1</sup>	
			Nitrate (NO <sub>3</sub> -N)			10. <sup>2,3</sup>	
			Selenium			.01 <sup>1,2,3</sup>	
			Sulfate			250. <sup>1</sup>	
			pH (SU)			6.5 to 9.0 <sup>3</sup>	---
			Conductivity(uomho/cm)			NA	---
			Total Dissolved Solids			500. <sup>1</sup>	
			Fluoride			1.4 to 2.4 (1,2,3)	---
			Water Level		NA	NA	---
January 1985 thru June 1985	H-56 Restricted Area	Groundwater	Alkalinity	6695	6521	NA	---
			Chloride	1041	1007	250. <sup>1</sup>	402.8
			Nitrate (NO <sub>3</sub> -N)	310	306	10. <sup>2,3</sup>	3060
			Selenium	0.09	0.088	.01 <sup>1,2,3</sup>	880
			Sulfate	7494	7373	250. <sup>1</sup>	2997
			pH (SU)	9.3	1.7	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	28488	27793	NA	---
			Total Dissolved Solids	19220	18864	500. <sup>1</sup>	3844
			Fluoride	3.6	3.26	1.4 to 2.4 (1,2,3)	---
			Water Level	91.75'	NA	NA	---

- NRC G.E.I.S. '79

- EPA Drinking Water Standard

3 - Utah State Drinking Water Standards

4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	H-71 Restricted Area	Groundwater	Alkalinity	499	325	NA	---
			Chloride	81	47	250. <sup>1</sup>	18.8
			Nitrate (NO <sub>3</sub> -N)	7	3	10. <sup>2,3</sup>	30
			Selenium	0.001	0	.01 <sup>1,2,3</sup>	0
			Sulfate	630	509	250. <sup>1</sup>	252
			pH (SU)	7.7	0.1	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	2200	1505	NA	---
			Total Dissolved Solids	1822	1466	500. <sup>1</sup>	364
			Fluoride	0.49	0.15	1.4 to 2.4 (1,2,3)	---
			Water Level	96.71'	NA	NA	---
January 1985 thru June 1985	H-72 Restricted Area	Groundwater	Alkalinity			NA	---
			Chloride			250. <sup>1</sup>	
			Nitrate (NO <sub>3</sub> -N)			10. <sup>2,3</sup>	
			Selenium			.01 <sup>1,2,3</sup>	
			Sulfate			250. <sup>1</sup>	
			pH (SU)			6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)			NA	---
			Total Dissolved Solids			500. <sup>1</sup>	
			Fluoride			1.4 to 2.4 (1,2,3)	---
			Water Level		NA	NA	---

- MRC G.E.I.S. '79

3 - Utah State Drinking Water Standards

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4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	H-73 Restricted Area	Groundwater	Alkalinity	202	28	NA	---
			Chloride	76	42	250. <sup>1</sup>	16.8
			Nitrate (NO <sub>3</sub> -N)	17	13	10. <sup>2,3</sup>	130
			Selenium	0.001	0	.01 <sup>1,2,3</sup>	0
			Sulfate	195	74	250. <sup>1</sup>	78
			pH (SU)	7.4	-0.2	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	1000	305	NA	---
			Total Dissolved Solids	624	268	500. <sup>1</sup>	124
			Fluoride	0.41	0.70	1.4 to 2.4 (1,2,3)	---
			Water Level	143.36'	NA	NA	---
			Alkalinity			NA	---
January 1985 thru June 1985	H-77 Restricted Area	Groundwater	Chloride			250. <sup>1</sup>	
			Nitrate (NO <sub>3</sub> -N)			10. <sup>2,3</sup>	
			Selenium			.01 <sup>1,2,3</sup>	
			Sulfate			250. <sup>1</sup>	
			pH (SU)			6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)			NA	---
			Total Dissolved Solids			500. <sup>1</sup>	
			Fluoride			1.4 to 2.4 (1,2,3)	---
			Water Level		NA	NA	---
			Alkalinity				
			Chloride				

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- EPA Drinking Water Standard

3 - Utah State Drinking Water Standards

4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	H-78 Restricted Area	Groundwater	Alkalinity	199	25	NA	---
			Chloride	571	537	250. <sup>1</sup>	214.8
			Nitrate (NO <sub>3</sub> -N)	30	26	10. <sup>2,3</sup>	260.0
			Selenium	0.001	0	.01 <sup>1,2,3</sup>	0
			Sulfate	221	100	250. <sup>1</sup>	88
			pH (SU)	7.50	-0.1	6.5 to 9.0 <sup>3</sup>	---
			Conductivity(uomho/cm)	2500	1805	NA	---
			Total Dissolved Solids	1509	1153	500. <sup>1</sup>	301.8
			Fluoride	0.15	-0.19	1.4 to 2.4 (1,2,3)	---
			Water Level	187.64'	NA	NA	---
			Alkalinity			NA	---
January 1985 thru June 1985	D-3 Restricted Area	Groundwater	Chloride			250. <sup>1</sup>	
			Nitrate (NO <sub>3</sub> -N)			10. <sup>2,3</sup>	
			Selenium			.01 <sup>1,2,3</sup>	
			Sulfate			250. <sup>1</sup>	
			pH (SU)			6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)			NA	---
			Total Dissolved Solids			500. <sup>1</sup>	
			Fluoride			1.4 to 2.4 (1,2,3)	---
			Water Level		NA	NA	---

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- EPA Drinking Water Standard

3 - Utah State Drinking Water Standards

4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	D-10 Restricted Area	Groundwater	Alkalinity	211	37	NA	---
			Chloride	642	608	250. <sup>1</sup>	243.2
			Nitrate (NO <sub>3</sub> -N)	49	45	10. <sup>2,3</sup>	450
			Selenium	0.019	0.012	.01 <sup>1,2,3</sup>	120
			Sulfate	261	140	250. <sup>1</sup>	104.4
			pH (SU)	7.8	0.2	6.5 to 9.0 <sup>3</sup>	---
			Conductivity(uomho/cm)	2450	1755	NA	---
			Total Dissolved Solids	1444	1088	500. <sup>1</sup>	288.8
			Fluoride	0.54	0.20	1.4 to 2.4 (1,2,3)	---
			Water Level	65.59'	NA	NA	---
January 1985 thru June 1985	DM80-1 Restricted Area	Groundwater	Alkalinity	245	71.0	NA	---
			Chloride	192	158	250. <sup>1</sup>	63
			Nitrate (NO <sub>3</sub> -N)	34	30	10. <sup>2,3</sup>	300
			Selenium	0.02	0.018	.01 <sup>1,2,3</sup>	180
			Sulfate	611	490	250. <sup>1</sup>	244.4
			pH (SU)	7.5	-0.1	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	1825	1130	NA	---
			Total Dissolved Solids	1476	1120	500. <sup>1</sup>	2952
			Fluoride	0.33	-0.01	1.4 to 2.4 (1,2,3)	---
			Water Level	67.62'	NA	NA	---

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3 - Utah State Drinking Water Standards

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4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations



3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	DM80-2 Unrestricted Area	Groundwater	Alkalinity			NA	---
			Chloride			250. <sup>1</sup>	
			Nitrate (NO <sub>3</sub> -N)			10. <sup>2,3</sup>	
			Selenium			.01 <sup>1,2,3</sup>	
			Sulfate			250. <sup>1</sup>	
			pH (SU)			6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)			NA	---
			Total Dissolved Solids			500. <sup>1</sup>	
			Fluoride			1.4 to 2.4 (1,2,3)	---
			Water Level		NA	NA	---
January 1985 thru June 1985	RW-1 Restricted Area	Groundwater	Alkalinity	8268	8094	NA	---
			Chloride	1089	1055	250. <sup>1</sup>	422.0
			Nitrate (NO <sub>3</sub> -N)	354	350	10. <sup>2,3</sup>	3500.0
			Selenium	0.07	0.068	.01 <sup>1,2,3</sup>	680.0
			Sulfate	7879	7758	250. <sup>1</sup>	3151
			pH (SU)	9.5	1.9	6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)	29988	29293	NA	---
			Total Dissolved Solids	20970	20614	500. <sup>1</sup>	4194
			Fluoride	3.6	3.26	1.4 to 2.4 (1,2,3)	---
			Water Level	165.79'	NA	NA	---

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4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

3a) GROUNDWATER - Dissolved Chemistries

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE CONCENTRATION (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
January 1985 thru June 1985	RW-2 Restricted Area	Groundwater	Alkalinity	1245	1071	NA	---
			Chloride	803	769	250. <sup>1</sup>	307.6
			Nitrate (NO <sub>3</sub> -N)	338	334	10. <sup>2,3</sup>	3340
			Selenium	0.01	0.008	.01 <sup>1,2,3</sup>	80
			Sulfate	2998	2877	250. <sup>1</sup>	1199
			pH (SU)	9.0	1.4	6.5 to 9.0 <sup>3</sup>	---
			Conductivity(uomho/cm)	10488	9793	NA	---
			Total Dissolved Solids	7066	6710	500. <sup>1</sup>	1413
			Fluoride	1.05	0.71	1.4 to 2.4 (1,2,3)	---
			Water Level	199.93'	NA	NA	---
			Alkalinity			NA	---
			Chloride			250. <sup>1</sup>	
			Nitrate (NO <sub>3</sub> -N)			10. <sup>2,3</sup>	
			Selenium			.01 <sup>1,2,3</sup>	
			Sulfate			250. <sup>1</sup>	
			pH (SU)			6.5 to 9.0 <sup>3</sup>	---
			Conductivity (uomho/cm)			NA	---
			Total Dissolved Solids			500. <sup>1</sup>	
			Fluoride			1.4 to 2.4 (1,2,3)	---
			Water Level		NA	NA	---

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4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

GROUND WATER MONITORING DATA  
DEPTH TO WATER

WELL	MW-9	H-10	H-48	H-55	H-72	H-77
<u>Quarter</u>						
1st 1985	212.56'	188.59'	148.67'	121.36'	75.70'	193.47'
2nd 1985	212.36'	188.19'	148.59'	121.73'	75.52'	193.48'

DATE COLLECTED	LOCATION	TYPE AREA	RADIONUCLIDE	AVERAGE CONCENTRATION (uCi/ml)	ERROR ESTIMATE (uCi/ml)	LLD (uCi/ml)	% MPCw
Jan. 1985 thru June 1985	SS-1	Surface Water Unrestricted	U-Nat d	0.18E-7	---	9.0E-9	0.06
			s	0.04E-7	---	9.0E-9	0.01
			Th-230 d	0.35E-9	0.43E-9	1.0E-9	0.02
			s	0.35E-9	0.33E-9	1.0E-9	-0-
			Ra-226 d	0.70E-9	0.38E-9	1.0E-9	2.33
			s	0.26E-9	0.25E-9	1.0E-9	-0-
			Pb-210 d	-0-	0.92E-9	1.0E-8	-0-
			s	0.53E-9	1.52E-9	1.0E-8	-0-
Jan. 1985 thru June 1985	SS-2	Surface Water Unrestricted	U-Nat d	0.33E-7	---	9.0E-9	0.11
			s	0.01E-7	---	9.0E-9	-0-
			Th-230 d	0.88E-9	0.43E-9	1.0E-9	0.04
			s	0.70E-9	0.39E-9	1.0E-9	-0-
			Ra-226 d	0.38E-9	0.28E-9	1.0E-9	1.3
			s	0.11E-9	0.16E-9	1.0E-9	-0-
			Pb-210 d	-0-	0.88E-9	1.0E-8	-0-
			s	-0-	1.45E-9	1.0E-8	-0-
Jan. 1985 thru June 1985	SS-7	Surface Water Unrestricted	U-Nat d	0.59E-7	---	9.0E-9	0.20
			s	0.01E-7	---	9.0E-9	-0-
			Th-230 d	0.81E-9	0.46E-9	1.0E-9	0.04
			s	0.67E-9	0.39E-9	1.0E-9	-0-
			Ra-226 d	0.33E-9	0.25E-9	1.0E-9	1.1
			s	0.06E-9	0.11E-9	1.0E-9	-0-
			Pb-210 d	-0-	0.94E-9	1.0E-8	-0-
			s	0.09E-9	1.51E-9	1.0E-8	-0-
			U-Nat d			9.0E-9	
			s			9.0E-9	
			Th-230 d			1.0E-9	
			s			1.0E-9	
			Ra-226 d			1.0E-9	
			s			1.0E-9	
			Pb-210 d			1.0E-8	
			s			1.0E-8	
			U-Nat d			9.0E-9	
			s			9.0E-9	
			Th-230 d			1.0E-9	
			s			1.0E-9	
			Ra-226 d			1.0E-9	
			s			1.0E-9	
			Pb-210 d			1.0E-8	
			s			1.0E-8	

= dissolved  
= suspended

% MPCw's are based upon the limits set in 10 CFR 20, Appendix B.

Dissolved MPC's are based upon soluble limits.

Suspended MPC's are based upon insoluble limits.

3b) LIQUID SAMPLES - Surface Waters

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	AVERAGE CONCENTRATION (ml/L)	STANDARD (mg/L)
January 1985 thru June 1985	Upper Tails Pond	Surface Water Restricted	Fluoride	215	1.4 to 2.4 (1,2,3)
January 1985 thru June 1985	Lower Tails Pond	Surface Water Restricted	Fluoride	232	1.4 to 2.4 (1,2,3)

1 - NRC G.E.I.S. '79

3 - Utah State Drinking Water Standards

2 - EPA Drinking Water Standard



4a) VEGETATION

ANNUAL - WILL BE COMPLETED 4th QUARTER 1985

MONTHS COLLECTED	LOCATION	TYPE/PORTION ANALYZED	RADIOISOTOPE	CONCENTRATION (uCi/Kg)	ERROR ESTIMATE (uCi/Kg)	LLD (uCi/Kg)
	EM-1 (S-1)	Comp./Dry Vegetation	Ra-226			2.E-7
			Pb-210			5.E-7
	EM-3 (S-3)	Comp./Dry Vegetation	Ra-226			2.E-7
			Pb-210			5.E-7
	EM-4 (S-4)	Comp./Dry Vegetation	Ra-226			2.E-7
			Pb-210			5.E-7
	EM-6 (S-6)	Comp./Dry Vegetation	Ra-226			2.E-7
			Pb-210			5.E-7

Vegetation samples are collected three times during the grazing season. Each assay represents a composite of three site-specific grab samples.

5a) SOIL

COLLECTED 3rd QUARTER ANNUALLY

DATE COLLECTED	LOCATION	TYPE/PORTION ANALYZED	RADIONUCLIDE	CONCENTRATION (pCi/g)	ERROR ESTIMATE (pCi/g)	LLD (pCi/g)
	EM-1 (S-1)	Grab/Surface	U-Nat		---	1.0
			Ra-226			0.2
			Pb-210			1.0
	EM-2 (S-2)	Grab/Surface	U-Nat		---	1.0
			Ra-226			0.2
			Pb-210			1.0
	EM-3 (S-3)	Grab/Surface	U-Nat		---	1.0
			Ra-226			0.2
			Pb-210			1.0
	EM-4 (S-4)	Grab/Surface	U-Nat		---	1.0
			Ra-226			0.2
			Pb-210			1.0
	EM-5 (S-5)	Grab/Surface	U-Nat		---	1.0
			Ra-226			0.2
			Pb-210			1.0
	EM-6 (S-6) Bckgrd.	Grab/Surface	U-Nat		---	1.0
			Ra-226			0.2
			Pb-210			1.0

b) SEDIMENT

COLLECTED 3rd QUARTER ANNUALLY

DATE COLLECTED	LOCATION	TYPE/PORTION ANALYZED	RADIONUCLIDE	CONCENTRATION (pCi/g)	ERROR ESTIMATE (pCi/g)	LLD (pCi/g)
	SS-1	Grab	U-Nat		---	1.0
			Th-230			0.2
			Ra-226			0.2
			Pb-210			1.0
	SS-2	Grab	U-Nat		---	1.0
			Th-230			0.2
			Ra-226			0.2
			Pb-210			1.0
	SS-3	Grab	U-Nat		---	1.0
			Th-230			0.2
			Ra-226			0.2
			Pb-210			1.0
	SS-7	Grab	U-Nat		---	1.0
			Th-230			0.2
			Ra-226			0.2
			Pb-210			1.0
	1000 ft. south of lower tls. pond. SS-4	Grab	U-Nat		---	1.0
			Th-230			0.2
			Ra-226			0.2
			Pb-210			1.0

6) DIRECT RADIATION

DATES MONITORED	LOCATION	AVERAGE EXPOSURE RATE (mr/qtr.)	ERROR ESTIMATE (mr/qtr.)
January 1985 thru June 1985	EM-1 (S-1)	9.5	5.9
January 1985 thru June 1985	EM-2 (S-2)	14.0	6.4
January 1985 thru June 1985	EM-3 (S-3)	15.0	6.3
January 1985 thru June 1985	EM-4 (S-4)	11.5	6.1
January 1985 thru June 1985	EM-5 (S-5)	15.0	6.6
January 1985 thru June 1985	EM-6 (S-6) (Background)	9.5	5.9

DOSE CONVERSION CALCULATION FOR INHALATION OF AIRBORNE PARTICULATES  
AT ENVIRONMENTAL MONITORING SITE NO. 4 (NEAREST RESIDENCE MONITOR)

(Gross Concentration) - (Background Concentration) = (Net Concentration) in uCi/ml

since:  $1 \times 10^{+12} \text{ uCi/ml} = 1 \text{ pCi/M}^3$

Net Concentration (uCi/ml)  $\times 10^{+12}$  = Net Concentration (pCi/M<sup>3</sup>)

and then:

Net Concentration (pCi/M<sup>3</sup>)  $\times$  Dose Conversion Factor (mrem/pCi/M<sup>3</sup>) = Dose (mrem)

NUCLIDE	EM-4 GROSS	-	EM-6 BACKGROUND	=	EM-4 NET	$\times 10^{+12}$	$\times$	ORGAN DOSE CONVERSION FACTOR
U-Nat	1.63E-15	-	4.90E-15	=	0			(pCi/M <sup>3</sup> ) $\times$ fi <sub>1</sub>
Th-230	1.13E-15	-	1.29E-15	=	0			(pCi/M <sup>3</sup> ) $\times$ fi <sub>2</sub>
Ra-226	0.19E-15	-	0.17E-15	=	0.02E-15			(pCi/M <sup>3</sup> ) $\times$ fi <sub>3</sub>

Organ Dose Conversion Factors (Fi)

From Table A-1 of "Compliance Determination Procedures for Environmental Radiation Protection Standards for Uranium Recovery Facilities, 40 CFR 190, November 1980".

	Whole Body	Bone	Lung
U-Nat	4.62	79.4	169.
Th-230	166.	5950.	3220.
Ra-226	30.9	309.	6610.

Radium 225

Whole Body	$2.0\text{E-}17 \times 1\text{E}+12 \times 30.9$	=	0.001 REM
Bone	$2.0\text{E-}17 \times 1\text{E}+12 \times 309$	=	0.006 REM
Lung	$2.0\text{E-}17 \times 1\text{E}+12 \times 6610$	=	0.132 REM

7) DOSE ASSESSMENT BASED UPON ACTUAL ENVIRONMENTAL  
MONITORING DATA AT THE NEAREST RESIDENCE - SITE NO. 4

Reporting Period:

Internal Radiation Exposure

The most probable pathway is inhalation of airborne particulates.

50 year dose commitment (mrem)

RADIONUCLIDE	WHOLE BODY (f)	BONE (f)	LUNG (f)
U-Nat	0.0	0.0	0.0
Th-230	0.0	0.0	0.0
Ra-226	1	6	132

For Dose Calculations, see Page

External Radiation Exposure

Nearest residence (EM-4) = Background (EM-6) = Net rate above background

$$11.5 \text{ mr/qtr} - 9.5 \text{ mr/qtr} = 2.0 \text{ mr/qtr}$$

(f) Based upon net nuclide concentrations.



SUPPLEMENTARY INFORMATION

Surface Water and Sediment Sampling Sites (See Attachment)

<u>SITE</u>	<u>DIRECTION FROM MILL</u>	<u>LOCATION</u>
SS-1	NW	West Coyote Wash
SS-2	NW	West Coyote Creek - Sunnyside Incline
SS-3	E	Ditch to Redd Reservoir
SS-7	E	Redd Reservoir
SS-4 (1000 ft. south of lower tailings pond)	SW	1000 feet south of the lower tailings pond

Environmental Monitoring Sites (See Attached Map)

<u>SITE</u>	<u>DIRECTION FROM MILL</u>	<u>LOCATION</u>
S1 (EM-1)	SE	South property boundary
S2 (EM-2)	SW	West property boundary
S3 (EM-3)	E	East property boundary
S4 (EM-4)	N	Nearest residence, approximately 1 mile north of property boundary
S5 (EM-5)	NE	La Sal School (occupiable structure)
S6 (EM-6)	NW	10.5 miles northwest of the mill

TABLE 1

MPC's Used in Calculation of % MPC

Reference 10 CFR 20, Appendix B

	Restricted Area (uCi/ml)			Unrestricted Area (uCi/ml)	
	Air		Water	Air	Water
	Ore	Yellowcake			
U-Natural	$.5 \times 10^{-10}$ uCi/ml	$1.0 \times 10^{-10}$ uCi/ml	$1 \times 10^{-3}$ S,I	$5 \times 10^{-12}$	$3 \times 10^{-5}$ S,I
Th-230		$2 \times 10^{-12}$ S	$5 \times 10^{-5}$ S	$8 \times 10^{-14}$ S	$2 \times 10^{-6}$ S, $3 \times 10^{-5}$ I
Pa-226		$3 \times 10^{-11}$ S	$4 \times 10^{-7}$ S	$2 \times 10^{-12}$ I	$3 \times 10^{-8}$ S, $3 \times 10^{-5}$ I
Pb-210		$1 \times 10^{-10}$ S	$4 \times 10^{-6}$ S	$4 \times 10^{-12}$ S	$1 \times 10^{-7}$ S, $2 \times 10^{-4}$ I
Bi-210		$3 \times 10^{-11}$ I	$2 \times 10^{-5}$ S	$1 \times 10^{-12}$ I	$7 \times 10^{-7}$ S, $3 \times 10^{-5}$ I
Ac-222				$3 \times 10^{-9}$	

S = soluble = dissolved

I = insoluble = suspended

Calculation:

Nuclide concentration at the location = Ni

Nuclide concentration at the background location = Nbi

Maximum Permissible Concentration for the nuclide (above) = MPCi

$$\% \text{ MPCi} = \frac{\text{Ni} - \text{Nbi}}{\text{MPCi}} \times 100$$

GROUND WATER DETECTION MONITORING PROGRAM  
 LICENSE AMENDMENT #2  
 Effective April 22, 1985

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MW-5 (Background)

<u>Date</u>	<u>As as mg/l</u>	<u>Se as mg/l</u>	<u>pH</u>
1 thru 3/85	NA	NA	7.7
4/85	.001	.001	7.7
5/85	.001	.013	7.4
6/85	.001	.001	7.5

H-49a

1 thru 3/85	NA	NA	NA
4/85	.001	.001	7.9
5/85	.054 $\bar{x}$	.001 $\bar{x}$	7.6
6/85	.013	.057	7.9

H-55

1 thru 3/85	NA	NA	9.7
4/85	.001	.13	9.6
5/85	1.20 $\bar{x}$	.04 $\bar{x}$	9.5
6/85	1.02	.17	9.5

H-56

1 thru 3/85	NA	NA	9.3
4/85	.001	.07	9.3
5/85	1.3 $\bar{x}$	.04 $\bar{x}$	9.3
6/85	1.4	.16	9.3

8.

Mill License Condition 42D requires that:

Documentation shall be provided to the NRC anytime a urinalysis or InVivo measurement exceeds 15 ug/l or 9 Ci of uranium respectively, and will include a summary of all corrective actions taken.

This documentation will be submitted with the semi-annual effluent report.

---

Name: DC Mill Maintenance

Date of Collection: May 16, 1985

Type of Bioassay - Urinalysis   X   InVivo Count           

Analytical Results

Urinalysis ug/l   44.5 u   InVivo Ci           

Corrective Action Taken:

5/15/85

Specimen collected as a baseline for Radiation Work Permit 4-23-85-1. Analytical results = 9.2 ug/l uranium in urine.

5/16/85

Specimen collected - results 44.5 ug/l of uranium in urine.  
Collection was less than 24 hours after the exposure - Reg. Guide 8.22, Part 5, specifies specimen should be collected at least 48 hours but not more than 96 hours after the most recent exposure.

This is not an acceptable sample as specified by Reg. Guide 8.22.

5/17/85

Specimen collected - analytical results = 5.4 ug/l of uranium in urine.

8.

Mill License Condition 42D requires that:

Documentation shall be provided to the NRC anytime a urinalysis or InVivo measurement exceeds 15 ug/l or 9 Ci of uranium respectively, and will include a summary of all corrective actions taken.

This documentation will be submitted with the semi-annual effluent report.

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Name: DC Mill Maintenance

Date of Collection: March 19, 1985

Type of Bioassay - Urinalysis X InVivo Count           

Analytical Results

Urinalysis ug/l 26.1 u InVivo Ci           

Corrective Action Taken:

3/18/85	Baseline bioassay for Radiation Work Permit 3-14-85-1. Analytical results = 10.9 ug/l uranium in urine.
3/19/85	Specimen collected - Results: 26.1 ug/l of u. This sample was not collected in accordance with the minimum 48 hour time period as specified in Reg. Guide 8.22.
3/20/85	Specimen collected. Results 10.9 ug/l of uranium in urine.
3/21/85	Specimen collected. Results 5.4 ug/l of uranium in urine.



8.

Mill License Condition 42D requires that:

Documentation shall be provided to the NRC anytime a urinalysis or InVivo measurement exceeds 15 ug/l or 9 Ci of uranium respectively, and will include a summary of all corrective actions taken.

This documentation will be submitted with the semi-annual effluent report.

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Name: JL Mill Maintenance

Date of Collection: May 5, 1985

Type of Bioassay - Urinalysis X InVivo Count           

Analytical Results

Urinalysis ug/l 15.7 u InVivo Ci           

Corrective Action Taken:

5/4/85 Off - Saturday

5/5/85 Baseline for RWP 4-23-85-1 Sunday  
2 hours on this RWP  
Exposure determination for this 8 hour day = 16.1%  
Exposure determination from the lapel sample calculated  
for an eight hour day = 3.2% MPC

5/6/85 Off - Vacation

5/7/85 Off - Vacation

5/9/85 Urine sample collected.  
Analytical results 6.3 ug/l uranium in urine.

8.

Mill License Condition 42D requires that:

Documentation shall be provided to the NRC anytime a urinalysis or InVivo measurement exceeds 15 ug/l or 9 Ci of uranium respectively, and will include a summary of all corrective actions taken.

This documentation will be submitted with the semi-annual effluent report.

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Name: CT Mill Maintenance

Date of Collection: May 6, 1985

Type of Bioassay - Urinalysis X InVivo Count           

Analytical Results

Urinalysis ug/l 19.6 u InVivo Ci           

Corrective Action Taken:

5/5/85	Regular day off (Sunday)
5/6/85	Specimen collected as a baseline for Radiation Work Permit 4-23-85-1.
5/7/85	Specimen collected - analytical results 31.1 ug/l uranium in urine.
5/10/85	Specimen collected - analytical results 6.5 ug/l of uranium in urine.

8.

Mill License Condition 42D requires that:

Documentation shall be provided to the NRC anytime a urinalysis or InVivo measurement exceeds 15 ug/l or 9 Ci of uranium respectively, and will include a summary of all corrective actions taken.

This documentation will be submitted with the semi-annual effluent report.

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Name: RL Mill Maintenance

Date of Collection: March 19, 1985

Type of Bioassay - Urinalysis X InVivo Count           

Analytical Results

Urinalysis ug/l 25.0 InVivo Ci           

Corrective Action Taken:

3/18/85

Specimen collected - baseline bioassay for Radiation Work Permit 3-14-85-1 - Results = 5.4 ug/l uranium in urine.

3/19/85

Specimen collected less than 24 hours after the exposure. Results = 25.0 ug/l of uranium in urine. This sample does not qualify as a valid sample as specified in Reg. Guide 8.22. 48 hours had not lapsed between the exposure and the specimen collection.

3/20/85

Specimen collected - Results 5.4 ug/l uranium in urine. 48 hours after the exposure.

3/21/85

Specimen collected - Results - 5.4 ug/l uranium in urine - 72 hours after exposure.

